REMARKS

Applicant is in receipt of the Official Action dated August 19, 2009 and its contents have been carefully considered. Applicants request that an interview be granted the undersigned attorney after considering this response in an effort to expedite the prosecution to an early allowance. The Examiner is requested to contact the undersigned after having had an opportunity to consider this response.

Applicant has amended the claims to more particularly define the invention and in response to the outstanding Official Action. A new claim set has been added to the application paralleling the previous claims. That is, claims 5-12 have been cancelled without prejudice or disclaimer and new claims 13 to 20 have been added to the application.

Applicant has carefully considered the rejection of claims 5-12 under 35 U.S.C. 112 as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicant regards as the invention, but is most respectfully traversed based on the amendment to the claims and the following comments. Applicant most respectfully submits that all of the claims are fully supported by the specification as originally filed and are clearly patentable over the references of record. In evaluating the claims, the level of one of ordinary skill in the art must be taken into consideration.

Applicant argues that the term "part-cooked" is a term widely used in the art and understood in the context of the production of French fries. It is used to describe the situation in which the potato product is initially fried but is not fully cooked, i.e. it is not yet ready for consumption. French fries are prepared by cutting potato strips or sticks and these potato cuts are fried to form a "part-cooked" French fry and then at least once more to produce the final French fried potato product for consumption. The initial part-cooking ensures that the centre of the potato stick is cooked all the way through; without this step the potatoes would either be

undercooked in the middle or overcooked on the outside. A "part-cooked" French fried potato is clearly one which is partially cooked throughout. Contrary to the assertion in the Official Action, no one skilled in the art would imagine the term "part-cooked" to mean that only a portion of the potato stick is fully cooked and ready for consumption while another portion is not.

Applicant also most respectfully submits that the term "physiologically acceptable acid" which is used in claim 6, now claim14 does not render the claim indefinite. The term "physiologically acceptable" is widely used in patent claims, particularly in the medical field, and is readily understood to encompass substances which are acceptable for delivery to the body, including by ingestion. In this particular case a physiologically tolerable acid is defined at page 2, lines 16-17 of the text as one which is "acceptable for use in foodstuffs".

The rejection of claims 5, 6, 11 and 12 as anticipated by Kaaber et al, in view of Junge et al and Slinde has been carefully considered but is most respectfully traversed. The Official Action bases this rejection on the Kaaber *et al.* paper which was cited in the first Action (although previously this was relied on solely in relation to obviousness). This document is cited in relation to claims 5, 6, 8, 9, 11 and 12 and the anticipation rejection of claims 8 and 9 is also traversed. In suggesting this document takes away the novelty of these claims, the Official Action also relies on some later-published documents as evidence that the *inevitable* result of performing the method of Kaaber would be something which falls within the scope of the claims, i.e. reduction of acrylamide levels. The documents on which he primarily relies as evidence are Jung *et al.* ("A Novel Technique for Limitation of Acrylamide Formation in Fried and Baked Corn Chips and in French Fries", J. of Food Science, 68:1287-1290, 2003) and Zyzak *et al.* (US 2004/0058046).

Applicant also wishes to point out that Kaaber discloses the production of chips from certain potato cultivars which have a high sugar content. The method involves fermenting the sliced potatoes using lactic acid bacteria prior to frying in oil

heated to 170°C in an Elframo EB cooking pan. Slinde is cited by the Examiner as suitable evidence that deep fat frying is accomplished in such a cooking pan. However, in Kaaber the treatment is carried out in order to reduce the content of reducing sugars and the ultimate aim is to produce an acceptable lighter coloured "chip" on frying. There is no mention whatsoever of any reduction in acrylamide levels nor the desire to achieve this. However, the Examiner relies on Jung as evidence that this effect would be an inevitable consequence of the processing steps taught by Kaaber.

The fact that Kaaber does not mention acrylamide reduction should be sufficient to take its teachings outside the scope of the method claims. However, putting this aspect aside for the moment, there are also other distinguishing features which applicant wishes to note. Kaaber is not concerned with French fries, but rather with chips. Whereas the chips with which Kaaber is concerned are produced from potatoes which are cut into thin slices (these are 1.5 mm thick slices - see under *Materials and methods* on page 40), French fries are produced from potato strips or sticks rather than slices. Not only this, but these are cooked in a different way. As noted above, French fries are made from potato strips or sticks which are prepared in a multi-stage cooking process. In contrast, chips are fried just once in a single, short frying time. Notably in Kaaber, the sliced potatoes are cooked for just 2 min. 15 s (see page 40, *Frying*). Due to their size and thickness, French fried potatoes are generally cooked for longer periods than this and in more than one step. What this does mean is that in Kaaber not only are "French fries" not produced, but there is no "part-cooking" involved and thus no production of any "part-cooked" product as required by the present claims. Regardless of the Examiner's view on the acrylamide aspect of the claims, the Kaaber paper is therefore concerned with the preparation of a different product to that presently claimed.

As previously noted, Kaaber is specifically concerned with a method of producing potato chips from potato cultivars with a high sugar content. It addresses the problem of darkening of chips which is known to occur on frying of potatoes which have a high reducing sugar content. The finding is that lactic acid fermentation is capable of reducing the sugar content of the potato slices to levels which do not cause unacceptable colouring on frying. As a result, Kaaber concludes that a number of potato cultivars previously not used for chips can now be used for frying (see final paragraph of the paper).

There is no mention of French fries, of acrylamide or of a reduction in acrylamide formation. The fact that production of acrylamide is simply not considered by Kaaber should be considered to further distinguish the subject matter of the claims over the disclosure of this earlier document.

In summary, Kaaber is not only concerned with a different product to that which is the subject of the present invention, but also a method which has an entirely different purpose. Given the different starting material (i.e. thin sliced potatoes to produce chips vs. thicker cut potato strips for French fries), the final material will also differ. Accordingly, claims 8 and 9 which cover the final French fried product should also be considered novel.

Still under the heading of novelty the Examiner adopts a similar position based on the teaching of Kaaber *et al.* as evidenced by Zyzak *et al.* For the same reasons given above, however, Kaaber fails to disclose several key features of the claimed methods and products. At least some of these deficiencies (notably those relating to the nature of the product) cannot be remedied by reference to the teachings of a secondary document. Thus, regardless of the Examiner's stance on the acrylamide aspect of the claims and the extent to which this may be read as a limiting feature, Kaaber does not disclose all remaining elements of the claims and so cannot be held to anticipate these.

Applicant points out on pages 6-8 the Official Action gives reasons why he considers claims 7, 10, 11 and 12 to lack inventive step and relies, once again, primarily on the Kaaber reference. In relation to claims 7 and 10 (directed to containers containing the oven-ready French fries) he seeks to combine the teaching of Kaaber with Zyzak. In relation to the inventive step of claims 11 and 12, the Examiner relies on Kaaber as evidenced by Jung. Claims 11 and 12 are the claims which recite that the acrylamide levels are reduced by 38%. This, according to the Examiner, would be an inevitable result of a routine optimisation of the lactic acid pre-treatment process described by Kaaber. However, for reasons already given, the disclosure of Kaaber differs in certain respects from the invention; these differences appear to have been overlooked in the Official Action in considering the obviousness of the claimed subject matter.

Applicant most respectfully submits that claims 7, 10, 11 and 12 should be acceptable as the main claims to the product, i.e. part-cooked French fries produced by the claimed process. It is therefore mainly in relation to these claims and the claims to the processes that the following comments are provided.

Central to inventive step is the reduction in acrylamide levels and whether it would have been expected by those skilled in the art that the lactic acid fermentation process of Kaaber would achieve this. Certainly there is nothing in Kaaber itself to suggest that this may be an effect of the reduction in reducing sugar content of the potatoes prior to cooking. However, the Examiner now relies on the new Zyzak reference to suggest this provides the "missing link" between Kaaber and the invention, i.e. the link between acrylamide formation and the presence of reducing sugars. Based on this link, the Examiner considers it obvious that lowering the content of reducing sugars using lactic acid fermentation as taught by Kaaber would result in a lowering of the acrylamide content in the fried product.

Zyzak is primarily concerned with conversion of asparagine into aspartic acid whereby to avoid the formation of acrylamide in various food products, including

chips and French fries. The Examiner specifically refers to paragraph [0014] which states: "foods richer in asparagine, when heated, tend to contain higher levels of acrylamide; this is especially the case when asparagine-containing foods are heated in the presence of reducing sugars." Whilst in paragraph [0014] Zyzak suggests there is an increase in the production of acrylamide when asparagine-containing foods are heated in the presence of reducing sugars, this document does not contain any hint or suggestion that the levels of reducing sugars might be altered to provide a solution to this problem. Indeed, it does not necessarily follow from this statement in Zyzak that reducing the presence of reducing sugars would inevitably have such an effect; rather, it is only with hindsight knowledge of the invention that the Examiner is able to deduce that this is the case.

In addressing the problem of acrylamide formation, Zyzak only concerns itself with the asparagine levels of the food and with methods aimed at removing the asparagine or converting it into another substance prior to cooking (see e.g. paragraph [0016]). This is achieved by the addition of an enzyme which hydrolyses the amide group on the side chain of asparagine prior to heating (i.e. cooking) and which in turn reduces the level of acrylamide in the finished food product. The theory behind this is discussed in paragraphs [0015] and [0017] and with reference to Figs. 1 and 2. Fig. 2 simply shows the conversion of asparagine to aspartic acid by hydrolysis of the amide bond. In Fig. 1 a general "carbonyl source" is shown reacting with asparagine to form a Schiff base and, ultimately, acrylamide. There is no suggestion that the carbonyl source need necessarily be a reducing sugar.

In order to arrive at the claimed invention starting from Kaaber those skilled in the art would thus have to decide to make a number of modifications. First of all they would need to decide to perform the claimed fermentation process on a different starting material (i.e. one which is used in the production of French fries) and which is cooked in a different way (i.e. part-cooked). Not only this, but the skilled person would have to appreciate that the process was effective in reducing

the acrylamide content of the final cooked product. Absent any clear teaching in any of the cited prior art documents that a reduction in the reducing sugar content of the product (as taught by Kaaber) would have such an effect, this would not be apparent. Contrary to the Examiner's suggestion, there is nothing in Zyzak which would render it obvious that lowering the reducing sugar content using the lactic acid fermentation treatment of Kaaber would result in a lower acrylamide content in the fried potato product. The reasons for this are that Kaaber only teaches that the effect of a reduction in reducing sugar content is one of reduced browning of the product on frying and Zyzak only teaches the use of enzymes to reduce the levels of asparagine in food products in order to reduce acrylamide.

It may also be noted that in contrast to the enzyme methods which are taught by Zyzak, those which are the subject of the present application (i.e. the use of lactic acid producing bacteria or physiologically acceptable acids) are much more straightforward to perform. Not only this, but they are much cheaper and easier to scale up and thus commercialise. Such advantages over the Zyzak process are considered to further support inventive step.

In view of the above, Applicants respectfully submit that the Election of Species Requirement does not accurately reflect the invention and respectfully request that it be withdrawn.

Respectfully submitted,
BACON & THOMAS, PLLC

By: Richard E. Fichter
Richard E. Fichter
Registration No. 26,382

625 Slaters Lane, Fourth Floor
Alexandria, Virginia 22314
Phone: (703) 683-0500
Facsimile: (703) 683-1080
REF/kco
A02 DRAFT.doc
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